

DISEASE NOTES



First Report of the Root-lesion Nematode *Pratylenchus neglectus* on Wheat (*Triticum aestivum*) in North Dakota

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Root-lesion nematodes (*Pratylenchus* spp.) are important nematode pests that invade roots of plants and restrict productivity of wheat (Smiley et al. 2005). In August 2015, a soil sample was collected from a harvested wheat field in Walsh County, ND, and was found to contain 1,044 root-lesion nematodes per kg of soil using the sugar centrifugal flotation method. In October 2015, four soil samples were collected from the same field and had root-lesion nematodes ranging from 125 to 1,000/kg soil. One soil sample with 500 lesion nematodes/kg soil was used to inoculate hard red spring wheat cvs. Glenn and Faller. After 10 weeks of growth in a greenhouse room maintained at 22°C, wheat roots were harvested and washed, and light brown lesions were observed on lateral roots. The washed roots were cut into 1-cm segments for nematode extraction using the Whitehead tray method. After 48 h, lesion nematodes were recovered from the root tissues. Averages of 24 and 20 root-lesion nematodes per gram were found in the roots of Glenn and Faller, respectively. Nematodes from soil and wheat roots were examined morphologically and molecularly for species identification. Morphological

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mean = 446.0 µm), stylet (15.0 to 17.5, 16.4), tail length (16.0 to 22.0, 18.8), body width (17.0 to 22.0, 19.6), anterior end to basal bulb (90.0 to 115.0, 101.6), a = (21.2 to 24.7, 23.1), b = (3.7 to 4.8, 4.4), c = (19.6 to 27.1, 23.8), and V (81.0 to 85.0%, 82.8%). The lip region had two annules, and was not set off, with anterior margins of apical lip annule convex, second annule was slightly wider than the first; lateral field had four lines with central zone of lateral field having oblique striae; tail terminus was smooth, rounded, or slightly oblique. The nematode species was identified as *Pratylenchus neglectus* (Rensch, 1924) Filipjev & Schuurmans Stekhoven, 1941 based on morphological and morphometric characteristics ([Castillo and Vovlas 2007](#)). DNA was extracted from single nematodes ($n = 11$) isolated from soil and wheat roots, and ITS region of rDNA was amplified ([Tanha Maafi et al. 2003](#)). PCR products from three nematodes were cloned using pGEM-T easy vector and sequenced, and the resulting ITS sequences were identical. The consensus sequence (GenBank Accession No. KU705392, 684 bp) was 99% homologous with one population of *P. neglectus* from China (JX046941) and 83% or less identical to other *Pratylenchus* spp. including *P. thornei*, a species closely related to *P. neglectus*. The specific primers from D3 28S rRNA and ITS rDNA were used to amplify DNA of eight nematodes and produced single bands specific for *P. neglectus* ([Yan et al. 2008, 2013](#)). The combination of the molecular tests confirmed the target species as *P. neglectus*. Two species of root-lesion nematodes, *P. neglectus* and *P. thornei*, were reported as damaging pathogens affecting wheat production in the Pacific Northwest ([Smiley et al. 2005](#)). To our knowledge, this is the first report of *P. neglectus* on wheat in North Dakota. The resistance levels of various wheat cultivars to this lesion nematode are being identified.



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